HUMAN RESOURCES FOR TREATING NEW CANCER CASES IN YEMEN

Executive Summary

The purpose of this report is to describe the human resources needed in Yemen to treat new cancer patients.

The population of Yemen is approximately 22.92 million (11.59 million men and 11.33 million women) and the estimated number of new cancer cases in Yemen for the year 2008, based on Globocan data for Yemen as a whole (http://globocan.iarc.fr/) was 10249 (4391 in men and 5858 in women) (Table A). The five most common cancers in Yemen are (1) hematological malignancies (Hodgkin lymphoma, non-Hodgkin lymphoma, multiple myeloma, leukemia), (2) breast, (3) head and neck (lip and oral cavity, nasopharynx, other pharynx, larynx and thyroid), (4) liver and (5) gynecological (cervix uteri, corpus uteri and ovary).

Table A: The ten most frequently occurring cancers in Yemen for men and women based on 2008 Globocan data (http://globocan.iarc.fr/).

Cancer	Both	Rank	Men	Rank	Women	Rank
All cancers excl. non-melanoma skin cancer	10249		4391		5858	
Hematological Malignancies	2032	1	1048	1	984	2
Breast	1253	2	0	15	1253	1
Head and Neck	1179	3	570	2	609	3
Liver	842	4	518	3	324	5
Gynecological	512	5				
Esophagus	498	6	331	4	167	9
Stomach	472	7	230	6	242	6
Colorectal	434	8	199	7	235	7
Urological	370	9	256	5	114	11
Brain, nervous system	314	10	145	9	169	8
Pancreas	228	11	95	10	133	10
Lung	217	12	149	8	68	12
Melanoma of skin	50	13	24	11	26	14
Gallbladder	48	14	20	12	28	13

Newly diagnosed cancer patients need pathology, surgery, chemotherapy and/or radiation therapy. The number of oncologists needed is based, therefore, on the number of patients requiring pathology, surgery, chemotherapy and radiation therapy (Table B). This number is estimated from the percentage of patients requiring surgery, chemotherapy and/or radiation therapy for the top ten cancers in both men and women. For developing countries the International Atomic Energy Agency (IAEA) recommends training radiation/clinical oncologists who can prescribe both radiation and chemotherapy for the common solid cancers, instead of separate medical and radiation oncologists. Hematological malignancies are treated primarily by hematologist-oncologists. The number of specialists needed is based upon the number of cancer patients but each city, in order to ensure coverage if one person leaves or goes on vacation, must have at least 2 surgical oncologists, 2 radiation/clinical oncologists, 2 hematologist oncologists, etc.

Table B: Number of oncologists needed for Yemen's two most populous governorates based on 2009 population estimates (http://citypopulation.de/) and 2008 Globocan data for new cancer cases (http://globocan.iarc.fr/).

	New Cancer Cases	Hematologist Oncologists	Surgical Oncologists	Radiation / Clinical Oncologists	Urologic Oncologists	Gynecologic Oncologist	Neuro-Oncologists	Pathologists
Taiz	1220	2†	*2*	7	2†	2†	2†	3
Al-Ḥudaydah	1105	2†	*2*	6	2†	2†	2†	3

†At least 2 are needed in each city.

In addition to oncologists, support staff such as onco-pharmacists, pharmacy technicians, oncology nurses and palliative care specialists is also needed. Many cancer patients require hospitalization for diagnosis, treatment and/or complications, therefore an adequate number of oncology beds will be needed. The number of oncology nurses, onco-pharmacists and pharmacy technicians needed is based upon the number of beds occupied daily by cancer patients while the number of palliative care specialists is based on the number of new cancer cases per year (Table C). The oncology nursing staff for each 24-bed oncology unit (operating 24 hours a day, 7 days a week) comprises of one head nurse and a nurse specialist as well as 13 nurses working 8 hour shifts, 5 days per week.

Table C: Number of oncology Units, oncology nursing and pharmacy staff needed for Yemen's two most populous governorates based on 2009 population estimates (http://citypopulation.de/) and 2008 Globocan data for new cancer cases (http://globocan.iarc.fr/).

	New Cancer Cases	Oncology Beds/Day	24 bed Oncology Wards	Onco-Pharmacists	Pharmacy Technicians	Palliative Care Specialists	Oncology Ward Nurses
Taiz	**1220**	23	1	4	6	3	15
Al-Ḥudaydah	**1105**	21	1	4	6	3	15

†At least 2 are needed in each city.

Since many cancer patients require radiotherapy, appropriately equipped facilities will be needed along with radiation oncology staff (Tables D and E). Radiation oncology staff includes radiation therapy technicians, medical physicists, Linac engineers and radiation oncology nurses in addition to radiation/clinical oncologists. The minimum radiation therapy equipment requirements are at least one of each: Linac, brachytherapy unit, CT simulator, treatment planning computer and dosimetry/quality assurance package.

Table D: Radiation Therapy Staff needed for Yemen's two most populous governorates based on 2009 population estimates (http://citypopulation.de/) and 2008 Globocan data for new cancer cases (http://globocan.iarc.fr/).

	New Cancer Cases	Radiation / Clinical Oncologists	Radiation Therapy Technicians	Medical Physicists	Linac Engineers	Radiation Oncology Nurses
Taiz	**1220**	7	9	3	2†	3
Al-Ḥudaydah	**1105**	6	8	3	2†	3

†At least 2 are needed in each city.

Table E: Radiation Therapy Equipment needed for Yemen's two most populous governorates based on 2009 population estimates (http://citypopulation.de/) and 2008 Globocan data for new cancer cases (http://globocan.iarc.fr/).

	New Cancer Cases	Linac / Co 60 Megavolt Unit	Brachytherapy Units	CT Simulators	Treatment Planning Computers	Dosimetry /QA Packages
Taiz	**1220**	2	1	1	1	1
Al-Ḥudaydah	**1105**	2	1	1	1	1

NOTE: Guidelines from the IAEA of the United Nations were used to calculate the radiation therapy equipment and staff needed in the setting of a developing Yemen. Guidelines from the Oncology Nursing Society were used to calculate the number of nurses needed. Several other specialty societies were also requested to provide guidelines but in most cases there were none, therefore colleagues active in those fields were consulted for estimating the number of staff needed.